

Design and Simulation Tools for Planetary Atmospheric Entry Vehicles, Phase I

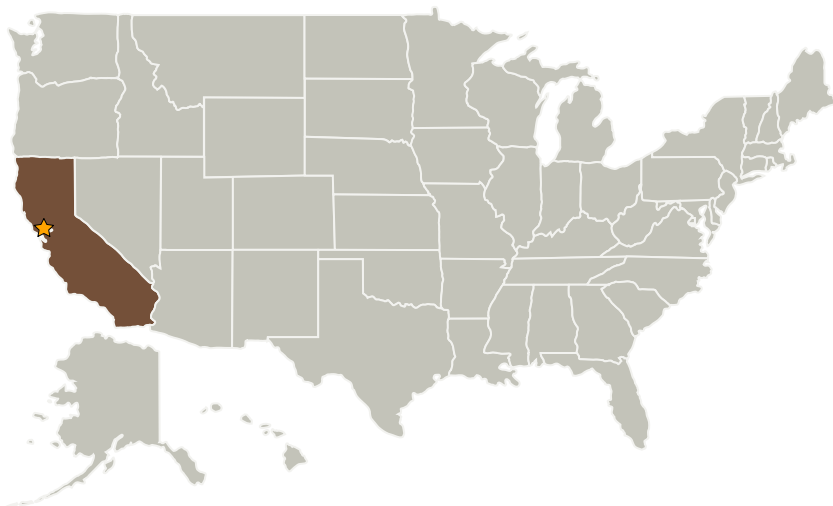
Completed Technology Project (2008 - 2008)



Project Introduction

Atmospheric entry is one of the most critical phases of flight during planetary exploration missions. During the design of an entry vehicle, experimental and analytical methods are used; however, the current integration level of experimental and analytical methods with planetary entry simulations is low. Comprehensive software, comprised of multiple design tool components for simulating planetary entry, analyzing experimental data, and evaluating configuration modifications and control designs, will be developed. The software will be configured so that it can accommodate vehicles ranging from blunt bodies to aircraft-like configurations. Furthermore, the software will be designed as an extension of current aircraft flight dynamics theory so that aerospace engineers with basic flight dynamics knowledge will have an easy transition to entry body flight dynamics. Merging of the aircraft and entry vehicle flight dynamics enables educational institutions to adopt entry vehicle flight dynamics as an extension to current aircraft flight dynamics educational programs. This will promote the education of the next generation of engineers with the basic knowledge of entry flight dynamics. The proposed software will run on a desktop / laptop computer so that proof-of-concept design work can be done easily, efficiently, and at low cost.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Aerospacecomputing, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Mountain View, California

Primary U.S. Work Locations

California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Leslie A Yates

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.1 Aeroassist and Atmospheric Entry
 - └ TX09.1.2 Hypersonic Decelerators